REMARKS

The Office Action dated February 9, 2004 and the Advisory Action dated June 4, 2004 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. No new matter has been added, and no new issues are raised which require further consideration and/or search. Claims 1-4, 6-15 and 17-23 are submitted for consideration.

Claims 1-4, 6-15, 17 and 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,394,436 to Meier et al. (Meier '436) in view of U.S. Patent No. 5,682,382 to Shepard, U.S. Patent No. 5,748,619 to Meier (Meier '619) and U.S. Patent No. 6,363,062 to Aaronson. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claims 1 and 12.

Claim 1, upon which claims 2-4, 6-11 and 23 depend, recites a method which includes the step of scheduling transmissions in a network. The network includes a plurality of collocated nodes and a plurality of non-collocated nodes, wherein the plurality of collocated nodes communicate between one another over a first interface and the plurality of non-collocated nodes communicate with the plurality of collocated nodes over a second interface. The method also includes the steps of exchanging first scheduling information between the plurality of collocated nodes over the first interface and exchanging second scheduling information associated with transmissions between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the

second interface. Each collocated node maintains a schedule entry for each neighboring collocated node. The schedule entry specifies the neighboring collocated node identifier and a timer. The timer determines a remaining time that the neighboring collocated node and its schedule information can be assumed to be valid. A value of the timer is updated with a reception of a schedule packet from a corresponding neighboring collocated node and the value of the timer is reduced each predefined unit of time. The collocated node determines that the corresponding neighboring collocated node is not reachable when the value of the timer is equal to zero. The method further includes the step of determining, based at least in part on the first scheduling information, a schedule for the plurality of collocated nodes for transmissions between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the second interface. The schedule includes information on when and in what order the transmissions may occur in the network. The step of exchanging of scheduling information between the plurality of collocated nodes over the first interface includes sending a schedule packet from a first collocated node to a second collocated node of the plurality of collocated nodes. The schedule packet includes an indication of all known nodes in the two-hop neighborhood of the first node, incoming and outgoing collision-free links of the first node that are already scheduled, time slots and data channels in which new links with the first node can be reserved, and time slots and data channels on which the first node will be listening while not active in scheduled links.

Claim 12, upon which claims 13-15 and 17 depend, recites a communications network that includes a plurality of non-collocated nodes, each of which are capable of receiving and transmitting transmissions on a first interface, and a plurality of collocated nodes, each of which are capable of communicating between one another over a second interface and each of which is further capable of receiving and transmitting transmissions to and from the plurality of non-collocated nodes on the first interface. The plurality of collocated nodes exchanges scheduling information with one another over the second interface. The scheduling information is associated with transmissions between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the first interface. Based at least in part on the scheduling information, a schedule is determined, for the plurality of collocated nodes, for transmission between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the first interface. Each collocated node maintains a schedule entry for each neighboring collocated node. The schedule entry specifies the neighboring collocated node identifier and a timer which determines a remaining time that the neighboring collocated node and its schedule information can be assumed to be valid. A value of the timer is updated with a reception of a schedule packet from a corresponding neighboring collocated node and the value of the timer is reduced each predefined unit of time. The collocated node determines that the corresponding neighboring collocated node is not reachable when the value of the timer is equal to zero. The plurality of collocated nodes exchanges scheduling information comprising a schedule packet. The schedule packet includes an indication of

all known nodes in the two-hop neighborhood of a sending collocated node, incoming and outgoing collision- free links of the sending collocated node that are already scheduled, time slots and data channels in which new links with the sending collocated node can be reserved, and time slots and data channels on which the collocated node will be listening while not active in scheduled links.

As will be discussed below, the cited prior art references of Meier '436, Shepard, Meier '619 and Aaronson fail to disclose or suggest the elements of any of the presently pending claims.

Meier '436 teaches an RF communications system that has a host computer, a network controller and bridges that are attached to a data communication link. A gateway which acts as the root node for the spanning tree of the RF data network is also attached to the communication link. Other bridges may be logically attached to the gateway by RF links. A second bridge is also attached to the gateway by hardwired communication links. Col. 3, lines 4-20. The system includes an optimal spanning tree which provides data pathways through the communication system. The optimal spanning tree is stored and maintained by the network as a whole, wherein each node stores and modifies information which specifies how local communication traffic should flow. Col. 3, lines 49-55. The optimal spanning tree is rooted at the gateway which is initially assigned an ATTACHED status while all other bridges are assigned an UNATTACHED status. The gateway node periodically broadcasts HELLO packets which include the sender's address, the hopping distance from the sender, the source address, a count of

nodes in the subtree and a list of system parameters. Col. 3, line 56- Col. 4, line 15. By listening to the HELLO messages, bridges can learn which nodes are attached to the spanning tree and a bridge may attach to the tree by sending an ATTACH request to the device that sent the received HELLO packet. The ATTACH request is then forwarded to the root node which responds by sending an ATTACH response to the requesting bridge. When the bridge receives the ATTACH response, the bridge enters the ATTACHED state. Col. 4, lines 27-35. When the ATTACH request is on its path towards the root node, each node records the necessary information on how to reach the requesting bridge. Col. 5, lines 32-35. Thereafter, the newly attached bridge begins to periodically broadcast HELLO packets and begins forwarding and relaying packets received. Col. 4, lines 36-53. Each attached bridge attempts to maintain attachment to the spanning tree at the node that is logically closest to the root node. Col. 4, lines 59-61.

Shepard teaches a radio network having decentralized channel management for providing collision-free packet transfer. The network includes stations that each independently produces and publishes a unique schedule of transmit and receive opportunities for itself. The schedule published by each station is a commitment by that station to refrain from transmitting at particular times during a receive window. A station with a packet to be sent directly to another station compares its own schedule with the receiving station's schedule and sends the packet during a time which one of its own transmit windows overlaps with a receive window of the receiving station enough to handle the packet length. Each station only needs to be aware of the schedule of the

immediate neighbors to which it might be directly sending packets in the neighborhood. Therefore, no global synchronization is required. Col. 9, line 53 - Col. 10, line 4.

Meier '619 teaches a wireless and wired communications network used to maintain communication pathways among wireless communication devices and remote stations. One object of Meier '619 is to route data through a wired and wireless communication network efficiently, dynamically and without looping. Another object is to make the routing of data transparent to wireless terminals and remote stations location on IEEE 802.3 type subnets. Another object is for the network to be capable of handling wireless communication device mobility and lost network nodes with minimal impact on the entire data communication system. Col. 2, lines 57-67.

Aaronson teaches a wireless mesh topology network having fully mutually interconnected, line-of-sight nodes. Communication between the nodes is by packets using the STS MAC protocol, where time is broken up into frames. In each frame there is a control channel where every node has scheduled slots with which to exchange control information for its neighbors. As part of the control channel, request with information about unscheduled periods in a requesting node's data channel is transmitted to a receiving node. The receiving node may grant or deny the transmission request from the requesting node. If the transmission request is granted, a schedule selected from the requester's schedule for when the requester is to transmit data is included in the grant response. Col. 4, lines 22-44.

Applicants respectfully submit that the combined cited prior art references fail to teach or suggest the elements of any of the presently pending claims. Claims 1 and 12, in part, recite that each collocated node maintains a schedule entry for each neighboring collocated node, the schedule entry specifying the neighboring collocated node identifier and a timer, the timer determines a remaining time that the neighboring collocated node and its schedule information can be assumed to be valid, a value of the timer being updated with a reception of a schedule packet from a corresponding neighboring collocated node and the value of the timer being reduced each predefined unit of time, wherein the collocated node determines that the corresponding neighboring collocated node is not reachable when the value of the timer is equal to zero. Applicants submit that Meier '436 simply does not teach or suggest maintaining a schedule entry with a timer for determining if a neighboring collocated node is reachable as recited in claims 1 and 12. The timing discussed in Meier '436 relates to displacement time for specifying an actual variation that will occur in the scheduled arrival of the very next hello message. See Col. 12, line 54-Col. 13, line 2 and Col. 16, lines 24-38 of Meier '436.

Applicants submit that Shepard, Meier, '619 and Aaronson fail to cure any of the deficiencies of Meier '436 as discussed above with regard to claims 1 and 12. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Meier '436, Shepard, Meier'619 nor Aaronson, whether taken singly or combined, teaches or suggests each feature of claims 1 and 12 and hence, dependent claim 2-4, 6-11, 13-15, 17 and 23 thereon.

Claims 18-22 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Meier '436 in view of Shepard, Aaronson, Meier '619 and U.S, Patent No. 5,673,031 to Meier (Meier '031). The Office Action states that rejection of claim 1 over Meier '436 in view of Shepard, Meier '619, and Aaronson applies to claim 18.

Similar to the arguments above for the previous rejection, Meier '031 also fails to cure the deficiencies in Meier '436 in view of Shepard, Aaronson, Meier '619 as Meier '031 does not even suggest that each collocated router maintains a schedule entry for each neighboring collocated router, the schedule entry specifying the neighboring collocated router identifier and a timer, the timer determines a remaining time that the neighboring collocated router and its schedule information can be assumed to be valid, a value of the timer being updated with a reception of a schedule packet from a corresponding neighboring collocated router and the value of the timer being reduced each predefined unit of time, wherein the collocated router determines that the corresponding neighboring collocated router is not reachable when the value of the timer is equal to zero as recited in claim 18. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Meier '436, Shepard, Meier, Aaronson nor Meier '031, whether taken singly or combined, teaches or suggests each feature of claims 18 and hence, dependent claim 19-22 thereon.

As noted previously, claims 1-4, 6-15 and 17-23 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is

therefore respectfully requested that all of claims 1-4, 6-15 and 17-23 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosure: Petition for Extension of Time (3 months)